PRELIMINARY ASSESSMENT

SITE: Hill Brothers Chemical Company

ADDRESS: 4450 North 42nd Avenue, Phoenix, Arizona

EPA ID #: AZD008397242

STATE ID #: 329

PREPARED BY:

NAME: Judy Heywood, Hydrologist

DATE: March 24, 1989

Arizona Department of Environmental Quality

Office of Water Quality

Groundwater Hydrology Section

Superfund Hydrology Unit

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SECTION I

PRELIMINARY ASSESSMENT

PRELIMINARY ASSESSMENT

HILL BROTHERS CHEMICAL COMPANY

1.0 SITE DESCRIPTION:

The Hill Brothers Chemical Company (Hill Bros.) is located at 4450 N. 42nd Avenue, in the city of Phoenix, Arizona. The facility is located within the NW¼, SW¼, Township 2 North, Range 2 East, Section 22 [(A-02-02)22cb]. The Hill Bros. Company operates a chemical distribution facility which receives chemicals by tanker truck and railroad cars. The chemicals are pumped into tanks on the site for storage and transferred into containers for distribution. The chemicals handled at Hill Bros. include acids, bases, solvents, and concrete additives.(1)

The Hill Bros. facility was built in 1969. Prior to 1969, this area was agricultural. The business and land owner of this facility is Hill Brothers Chemical Company which is based at 1675 N. Main Street, Orange, CA 92667. The current president and director of the company is C. Dean Hill. The Hill Bros. Company employs 17 people at this location and occupies four acres.(1)(2)

Hill Bros. is bordered on the north by Hogon Manufacturing (no longer in operation); the east by 42nd Avenue; the south by SRL Company; and the west by the railroad tracks and 43rd Avenue. Hill Bros. is located in an industrial and commercial area in an urban setting. The land use in a three mile radius of Hill Bros. is mixed and includes industrial, commercial and residential uses.

2.0 APPARENT PROBLEM:

Volatile organic compounds (VOCs) were first detected in groundwater in the area, termed the West Central Phoenix area, in July 1982. The City of Phoenix detected trichloroethylene (TCE) in four municipal supply wells (Nos. 70, 71, 151, and 152). The Arizona Department of Health Services (AHS), Salt River Project (SRP), and the City of Phoenix confirmed the presence of VOCs in the groundwater with sampling in 1983, 1985, and 1986.[3]

The West Central Phoenix area was designated a Water Quality Assurance Revolving Fund (WQARF) State Superfund site in 1986. The area was defined for the purposes of the WQARF study by Camelback Road to the north, Interstate Highway (I-17) to the east, McDowell Road to the south, and 83rd Avenue to the west.[3]

Under the WQARF program, the Earth Technology Corporation (ETC) received a contract from ADEQ to conduct a preliminary remedial investigation to assess the nature, extent, severity, and potential sources of volatile organic compounds (VOCs) detected in groundwater beneath the study area.[3]

According to the Earth Technology Corporation report, groundwater contamination in the West Central Phoenix study area occurs in four distinct locations. One of these areas is a localized area of 1,1-dichloroethene (1,1-DCE) contamination in the north-eastern section of the study area. The Hill Bros. Chemical Company facility is located less than one-half mile north-northwest from the known area of 1,1-DCE contamination.[3]

2.0 APPARENT PROBLEM (cont'd):

The 1,1-DCE was detected in groundwater samples collected from City of Phoenix Northwest Service Center (NWSC) monitoring well MW-24. The samples collected in March and September, 1988 had 1,1-DCE concentrations of 9.0 ug/l and 4.9 ug/L, respectively. The EPA MCL and Arizona Action Level for 1,1-DCE is 7.0 ug/L.(3) In addition to MW-24, VOCs were detected in groundwater samples collected from four other NWSC monitor wells (Nos. 3, 4, 6, and 8). These wells are located on the City of Phoenix NWSC property, as shown in Figures 7 and 8. Samples were collected from these wells and submitted for analysis on 7/1/86. The results of these analysis are given below.

	MW-3	MW-4	MW-6	MW-8
Methylene Chloride	830 ug/L	785	784	800
Acetone	685	520	470	540
1,1-DCE	51	---	---	---

The City of Phoenix NWSC is a vehicle service and maintenance operation located at 4019 West Glenrosa [(A-02-02)22ca and cd]. In May of 1986, a release of unleaded gasoline from one of the facilities underground storage tanks was discovered. It was estimated that 420,000 gallons of fuel was released to the subsurface. Both floating free product and a dissolved contaminant plume are present beneath the site. At the present time, product recovery and groundwater remediation are taking place.(4)

2.0 APPARENT PROBLEM (cont'd):

The COP response to the ADEQ's 1988 hazardous material questionnaire did not indicate the use of any chlorinated solvents at NWSC. In addition, based on available data, unleaded gasoline does not contain 1,1-DCE or any chemicals that could degrade into 1,1-DCE. Therefore, it appears that the NWSC is not the source of contamination detected in NWSC MW-24. Rather, 1,1-DCE appears to have migrated from off site.

Although 1,1-DCE was detected in NWSC MW-24, it was not detected in two additional monitoring wells located 400 feet north (NWSC MW-23) and 800 feet south (NWSC MW-GTD). Since all three wells are perforated at the same intervals, it appears the 1,1-DCE is not migrating on-site from these directions. The remediation currently underway at COP NWSC (pump and treat) may be influencing the groundwater flow direction in the area, and may be pulling 1,1-DCE into NWSC wells from the east, west or northwest.(3) Hill Bros. is located 0.5 mile north-northwest from the NWSC wells and could be influenced by the NWSC remediation pumping.

Under laboratory conditions, both TCE and 1,1,1-trichloroethane (TCA) have been shown to degrade to 1,1-DCE. In addition, tetrachlorethene (perchloroethylene, PCE) has also been shown to degrade to TCE, and subsequently to 1,1-DCE.(3) Therefore, disposal of the primary solvents TCA, TCE or PCE could be the source of the 1,1-DCE in the groundwater.

As mentioned, Hill Bros. Chemical Company is located approximately 0.5 mile north-northwest of NWSC. The Hill Brothers Chemical Company is a wholesale

I doubt that this could be true w/ out the other compounds also

2.0 APPARENT PROBLEM (cont'd):

distributor of industrial chemicals. Operations at this facility include the storing, manufacturing and repackaging of chemicals for resale. This facility reports that they transport and store hazardous substances, but do not generate, treat, or dispose of hazardous wastes Table 2 lists the facility's current hazardous materials inventory on site. This list includes: acids, alcohols, acetone, methylene chloride, PCE, toluene, TCA, xylene, and various other chemicals. Hill Bros. reports they do not dispose of, or manifest hazardous wastes from this facility. They are required, by the City of Phoenix, to pre-treat wastes prior to discharge into the sewer system. This pre-treatment consists of an adjustment to neutralize pH prior to discharge.

A review of ADEQ's Emergency Response Unit's Incident Reports indicate a potential for a release of hazardous substance to the environment in the past. In 1984, Hill Brothers had two spills on site: On April 11 an unknown amount of an acid was spilled and on August 9 an unknown amount of ammonia was spilled. The ADEQ's Hazardous Materials Team responded to both of these incidents. In June of 1986, 300 pounds of chlorine was released at Hill Bros. The City of Phoenix Fire Department responded to that incident. Most recently, on January 1, 1988, 7,000 gallons of sulfuric acid (40%) was spilled on site. The acid was contained and 95% of the spilled acid was recovered.(5)

3.0 HRS FACTORS

3.1 Observed Releases:

There has been no documented observed release to groundwater, surface water, or air from the Hill Bros. Chemical Company.

3.0 HRS FACTORS

3.1 Observed Releases (cont'd):

The potential for an observed release to groundwater and air exists at this facility due to the types and amounts of chemicals stored on site, and the nature of their operation. Hill Bros. receives chemicals in bulk (liquid, gas and dry) and repackages then for sale to retailers. These activities, examined in the context of earlier spills, indicate the possibility for a release to the subsurface and the air.

The potential for a release to surface water does not appear to be present due to the lack of a surface water pathway.

3.2 DIRECT CONTACT/FIRE AND EXPLOSION:

Public access to the Hill Bros. Chemical facility is restricted. A locked chain-link fence encloses the facility and public access is limited to the office area.

No documented incidents of direct exposure to the general public have been reported. As mentioned previously, there has been releases of hazardous materials on site. However, it has not been documented if the hazardous materials released in these incidents migrated off site and came into contact with the general public.(5)

3.2 DIRECT CONTACT/FIRE AND EXPLOSION (cont'd):

The potential for a fire/explosion at the facility exists due to the type and amounts of chemicals stored on site. See Table 2. However, this facility is required to store hazardous chemicals according to OSHA regulations, and the potential is rated as low.

3.3 WASTE TYPE/QUANTITY:

The Hill Bros. Chemical Company is a wholesale distributor of industrial chemicals. They report that they store, manufacture, and repackage chemicals for resale. Hill Bros. reports that they transport and store hazardous substances. Hill Bros. is required by the City of Phoenix to pre-treat waste water prior to discharge into the sewer system. The waste water is generated from the floor drains in the acid and caustic blending area. The facility neutralizes the pH of the waste water prior to discharge. With the exception of the above treatment, Hill Bros. reports that they do not generate, treat or dispose of hazardous materials. Any possible release into the environment would result from a leak or spill of the hazardous materials during repackaging, etc.

The hazardous substances used on this site (listed in Table 2) include: acids, sodium hypochlorite, sodium hydroxide, anhydrous ammonia, 1,1,1-TCA, PCE, and methylene chloride. The quantities of hazardous materials kept on site are also listed in Table 2. The Hazardous Materials Inventory (Table 2) lists the substances currently on site, but the historical inventory is not known.

3.3 WASTE TYPE/QUANTITY (cont'd):

In addition to the above list of chemicals, Hill Bros. handles a line of concrete additives. These additives include accelerators (calcium chloride), water reducers, air entrainment, plasticizers, silica and reinforcing fibers. The chemical composition of these additives is not known.

Toxicity and persistence data on the current chemical inventory on site ranges from 6 to 12.[6]

	TOXICITY PERSISTENCE VALUE	
	Groundwater	Air
acetic acid	6	6
ferric chloride		
methyl ethyl ketone	6	6
hydrochloric acid	9	6
acetone	6	6
anhydrous ammonia	6	9
nitric acid	9	9
perchloroethylene	12	-
sulfuric acid	9	9
toluene	9	6
1,1,1-TCA	12	6
xylene	9	6

Hill Brothers reports they have two-6,000 gallon underground storage tanks that contain diesel fuel at this facility. These tanks are currently in use at this facility.[7]

3.3 WASTE TYPE/QUANTITY (cont'd):

Table 2 and the facility map list all above ground tanks and their contents that are currently located at this facility. The quantities of hazardous materials stored on site based on the once through volume of above ground tanks is equivalent to 4,088 drums (55 gallons). The above ground tank volumes were used to determine waste quantity due to the history of spills and/or leaks at the Hill Bros. facility.

3.4 GROUNDWATER:

The main source of groundwater in the west-central Phoenix area is the valley-fill deposits of the West Salt River Valley sub-basin. The valley-fill deposits are extremely heterogeneous, but have been differentiated based on lithology. The units, in ascending order, are: the lower conglomerate unit, middle fine-grained unit, and upper alluvial unit, all of which are hydraulically interconnected to some degree.(8)

The primary source of groundwater in the area is the Upper Alluvial Unit, which consists of deposits of unconsolidated and weakly consolidated gravel, sand, silt, and clay. The Upper Alluvial Unit extends across most of the West Salt River Valley and ranges in thickness from 1 to 1,200 feet. In the vicinity of Hill Brothers facility, this unit is estimated to be between 400 to 550 feet thick.(9)

The Middle Fine-Grained Unit is composed of middle to late Tertiary deposits consisting of interbedded sand, silt, clay, and evaporite. This unit is

3.4 GROUNDWATER (cont'd):

estimated to be between 350 to 450 feet thick in the area around Hill Brothers. This unit is generally considered an aquitard but does yield water from inter-bedded, coarser playa deposits and sandy horizons. The Lower Conglomerate Unit is composed of coarse-grained sand and gravel-cemented conglomerate and overlies the basement complex. Groundwater in this unit occurs in confined conditions. The basement complex is composed of granite, gneiss, and schist and is considered to be of no major significance as a source of groundwater.(9)

Groundwater occurs generally under unconfined conditions in the area around Hill Brothers at depths ranging from 100 to 130 feet below surface. However, in localized areas, groundwater may occur under semi-confined, confined, or perching conditions due to the presence of fine-grained materials.(9)

At the COP NWSC (located less than .25 mile south of Hill Brothers) groundwater occurs in unconfined conditions at a depth of 115 feet below land surface.(9)

Depth to groundwater within a three mile radius around Hill Brothers ranges from 72.5 feet below land surface (bls) two miles northeast, to 236 feet bls three miles to the north. The direction of regional groundwater flow was to the west-northwest in 1983. The regional groundwater gradient is approximately 0.002 (11 feet per mile). A groundwater contour map developed for the West Central Phoenix Study area by Earth Technology Corp. (ETC), indicates that groundwater flow may now be to the west-southwest based on 1987-88 water level data from COP and SRP wells.(3)

3.4 GROUNDWATER (cont'd):

Pumping associated with the groundwater remediation at NWSC may locally alter the groundwater flow direction at the Hill Brothers facility.[7][9]

As Figures 5 and 6 show, several areas of groundwater contamination have been documented in the West Central Phoenix Area. One of these areas is located south of Hill Brothers, but appears to be a separate contaminant plume unrelated to the 1,1-DCE detected at NWSC monitor well #24. In the area contaminated by 1,1-DCE (Figure 6), only the upper alluvial unit is thought to be affected.[3]

There are approximately 132 wells registered with the Arizona Department of Water Resources within a three mile radius from the Hill Brothers facility. Groundwater from these wells are used for the following purposes: 22 public drinking water; 8 domestic; 22 irrigation; 7 test, and 54 for monitoring in accordance with various environmental programs. The use of the last 19 wells is variously: unknown, unused, or used for cathodic protection.[10]

The closest irrigation or drinking water well to the Hill Bros. site is City of Phoenix public supply well #69 [(A-02-02)22daa], located approximately 0.5 mile to the west. The target population for drinking water wells within a three mile radius of Hill Bros. is 927,965, based on 1980 census figures. Groundwater from the City of Phoenix public supply wells is blended together with surface water to serve the Phoenix metropolitan area.[10][11]

3.4 GROUNDWATER (cont'd):

The surface soil deposits in the area around Hill Brothers belong to the Gilman-Loam Association and consist of deep, well-drained soils formed in recent alluvium. The alluvium was derived from andesite, basalt, schist, rhyolite, and granite-gneiss. Permeability of this surface soil is rated as moderate.(12)

Well drillers logs for wells in the area characterize the unsaturated zone as silty fine-grained sands, clays and gravel. There does not appear to be a continuous clay layer through the area. The hydraulic conductivity of these heterogeneous sediments is estimated to range from 10^{-3} to 10^{-7} cm/sec. This wide range in permeability makes characterization of the potential for an observed release from Hill Bros. into the groundwater uncertain.(13)

The net precipitation for the months of November thru April is -12.63 inches. A 24-hour rainfall is approximately 1.63 inches.(14)(15)

3.5 SURFACE WATER:

The Hill Bros. facility is located one-half mile north of the Grand Canal, a Salt River Project irrigation canal. The canal transports irrigation water across the valley and is not used as a source of drinking water. The canal is banked and elevated to prevent surface run-off from entering it. There is no surface water pathway present from the Hill Bros. facility to the canal. There is no target population for surface water pathway related to Hill Bros.(16)

3.5 SURFACE WATER (cont'd):

The site's topography has been altered due to urbanization, but the area appears to slope to the southwest approximately 20 feet per mile. The 24-hour rainfall is approximately 1.63 inches.[15][16]

3.6 AIR

There have been no documented air releases as defined by the Hazard Ranking System (HRS) from this facility.[17]

The potential for a release into the air from this facility is present due to the nature of the operations conducted at this facility. Chemicals are mixed, transferred, and transported in liquid and gas phases. A release could easily occur due to venting and procedures used in transferring the chemicals. It is possible that a release of acid, ammonia, or chlorine to the air has occurred in the past during the spills or leaks reported by Hill Bros. The potential for a release to the air is rated as low due to the control devices in place at this facility. Gases from tanks containing liquid chlorine, sulfuric acid, muriatic acid (hydrochloric acid), nitric acid and ammonium hydroxide are hood vented to a water scrubber. The bulk solvent storage tanks are equipped with pressure release valves and a "conservative control valve" to prevent release to the air. The paint spray booth is permitted by Maricopa County and is equipped with features designed to reduce emissions.[17]

3.7 OTHER HRS FACTORS

The facility is located within the boundaries of the West Central Phoenix Area WQARF site, one of the State Superfund sites. One of the objectives of the WQARF program is to identify facilities responsible for contaminating the groundwater and to invite them to perform their own investigation and remediation. If the facility is no longer in existence, bankrupt, or uncooperative, the State will perform the investigation and cleanup and pursue cost recovery.

Within a three mile radius of the Hill Bros. facility, there are no Federal and State endangered species, critical habitats, wetlands, or wildlife areas.

4.0 DRAFT REVISED HRS CONSIDERATIONS

The Hill Bros. facility does not pose an actual or potential threat to sensitive environments or to contamination of the food chain.

The risk of direct on-site exposure to the general public is low from activities at the Hill Bros. facility. The site is fenced and access is restricted. The potential for an air release at this site is low due to containment features at the facility. The potential does exist for accidental surface spills or leaks occurring on-site.

5.0 OTHER REGULATORY INVOLVEMENT

Hill Brothers has obtained the following permits:

City of Phoenix Industrial Wastewater Discharge Permit #: 8809-1550

Air Pollution Control Permit: A8601089

Hill Bros. has obtained a RCRA facility ID number (AZD008397242) and is classified as a large quantity generator of hazardous waste.

As stated previously, this facility is located in the West Central Phoenix State Superfund (WQARF) area. Hill Bros. was identified in the draft Phase I report by the State's consultant as a facility where further work should be initiated in order to determine whether a release to groundwater has occurred.

6.0 REMOVAL CONSIDERATION

Does not apply to this facility.

7.0 CONCLUSIONS and RECOMMENDATIONS

7.1 Conclusions:

The Hill Brothers Chemical Company is located at 4450 N. 42nd Drive, in the City of Phoenix, Arizona. This company operates a chemical distribution facility in which tanker trucks and railroad cars deliver chemicals to the facility in bulk form. The chemicals are pumped or transferred into tanks on the site for storage and transferred into containers for distribution. The

7.0 CONCLUSIONS and RECOMMENDATIONS

7.1 Conclusions (con't):

chemicals handled at Hill Bros. include: acids, bases, solvents, and concrete additives. Hill Bros. has been in operation at this location for 20 years, since 1969.

Hill Brothers reports they do not generate any hazardous waste from their operation. Waste water is pre-treated to neutralize pH prior to discharge to the sewer. Any potential for an observed release at this facility would involve the spill, leak, or discharge of hazardous materials stored or formulated at this site.

Hill Bros. is located less than 0.25 mile from COP NWSC MW-24 were 1,1-DCE was detected in the groundwater. Under laboratory conditions, both TCE and TCA have been shown to degrade to 1,1-DCE. In addition, PCE has also been shown to degrade to TCE and subsequently to 1,1-DCE. The hazardous materials used at Hill Brothers have a relatively high toxicity/persistence value (PCE = 12; TCA = 12). Hill Brothers reports they do not generate hazardous waste, however, the quantities of hazardous materials stored on site is high (equivalent to at least 4088 drums). The groundwater use within a three mile radius is public supply for a target population of 927,965.

7.2 Recommendations

EPA:

A Medium Priority Screening Site Inspection (mSSI) is recommended for Hill Brothers Chemical Company because the site could qualify for inclusion on the NPL due to the following factors:

- high groundwater target population
- high toxicity value for materials on site
- potentially high waste (hazardous materials) quantity value, and
- 1,1-DCE detected in a well less than .25 mile from Hill Bros.

This SSI should include, but is not limited to:

* Use of soil gas analysis around the facility's storage and disposal areas.

* Obtain groundwater sampling results for other COP NWSC monitoring wells (VOCs).

* Sample COP NWSC wells for VOCs, dependent on the historic data obtained during the previous task.

State:

No recommendation for State action for this facility.

ADEQ MANAGEMENT REVIEW

	Initial	Date
Concurrence	CGG	5-15-89

EPA RECOMMENDATION FOR FURTHER ACTION:

	Initial	Date
No Further Action Under CERCLA		
High Priority SSI		
Medium Priority SSI		

Notes:

REFERENCES

[1]Hill Brothers Chemical Company, November 14, 1988. Arizona Department of Environmental West Central Phoenix Area Hazardous Materials Questionnaire.

[2]Arizona Corporation Commission, Annual Report and Certificate of Disclosure, February 16, 1988.

[3]The Earth Technology Corporation, Draft Phase I Report, West Central Phoenix Area, Task Assignment E-1, Phoenix, Arizona. December 1988.

[4]Groundwater Technology, Inc., Preliminary Report on Phase I Results of the Subsurface Investigation to Assess the Impact of an Unleaded Gasoline Loss at the Northwest Service Center, August 1986., February, 1987 and December, 1988. Prepared for the City of Phoenix.

[5]Arizona Department of Environmental Quality, 1989. Unpublished RCRA listing and inspection files, RCRA Compliance Unit, Department of Environmental Quality, Phoenix, Arizona.

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[6]EPA Hazard Ranking System Waste Values (Toxicity/Persistence Matrix)

[7]Notification for Underground Storage Tanks, EPA Form 7530-1 Completed for Hill Brothers Chemical by Don Catt, January 14,1986.

[8]Reeter, R.W. and Remick, W.H., July, 1986. Map showing Groundwater Conditions in the West Salt River, East Salt River, Lake Pleasant, Carefree, and Fountain Hills sub-basins of the Phoenix Active Management Area, Maricopa, Pinal, Yavapai Counties, Arizona--1983. Department of Water Resources Hydrologic Map Series Report No. 12.

[9]Groundwater Technology, Inc., Application for Poor Quality Groundwater Withdrawal Permit for the Northwest Service Center at 4019 West Glenrosa, Phoenix, Arizona., October, 1986.

[10]Arizona Department of Water Resources, Well Inventory, Merge Database, 1989.

[11]Arizona Statistical Review - 43rd Annual Edition. Valley National Bank of Arizona. September, 1987.

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[12]Hartman, George, Soil Survey of Maricopa County, Arizona, Central Part, United States Department of Agriculture, Soil Conservation Service, September, 1977.

[13]Davis, S.N. Porosity & Permeability of Natural Materials in Flowthrough Porous Media, R.J.M. DeWest ed., Academic Press, New York, 1969.

[14]Rainfall Frequency Atlas of the United States, Technical Paper No. 40, U. S. Government Printing Office, Washington, D.C., 1983.

[15]Climatic Atlas of the United States, U. S. Department of Commerce, Environmental Science Services Administration, Environmental Data Service, June, 1968.

[16]United States Geological Survey, Fowler, Arizona, 7½ minute Topographic Map, 1952. Photo revised 1967 and 1973.

[17]Heywood, Judy, Arizona Department of Environmental Quality and Larry Crisafulli, Maricopa County Air Quality, telephone conversation, March 24, 1989.

SECTION II

MAPS and TABLES

Maps

1. Location Map
2. Site Location Map
3. Facility Diagram
4. Groundwater Flow and Depth-to-water
5. Plume - TCE
6. Plume - 1,1-DCE
7. NWSC - Well Locations
8. NWSC - Gradient

FIGURE 1

Location Map

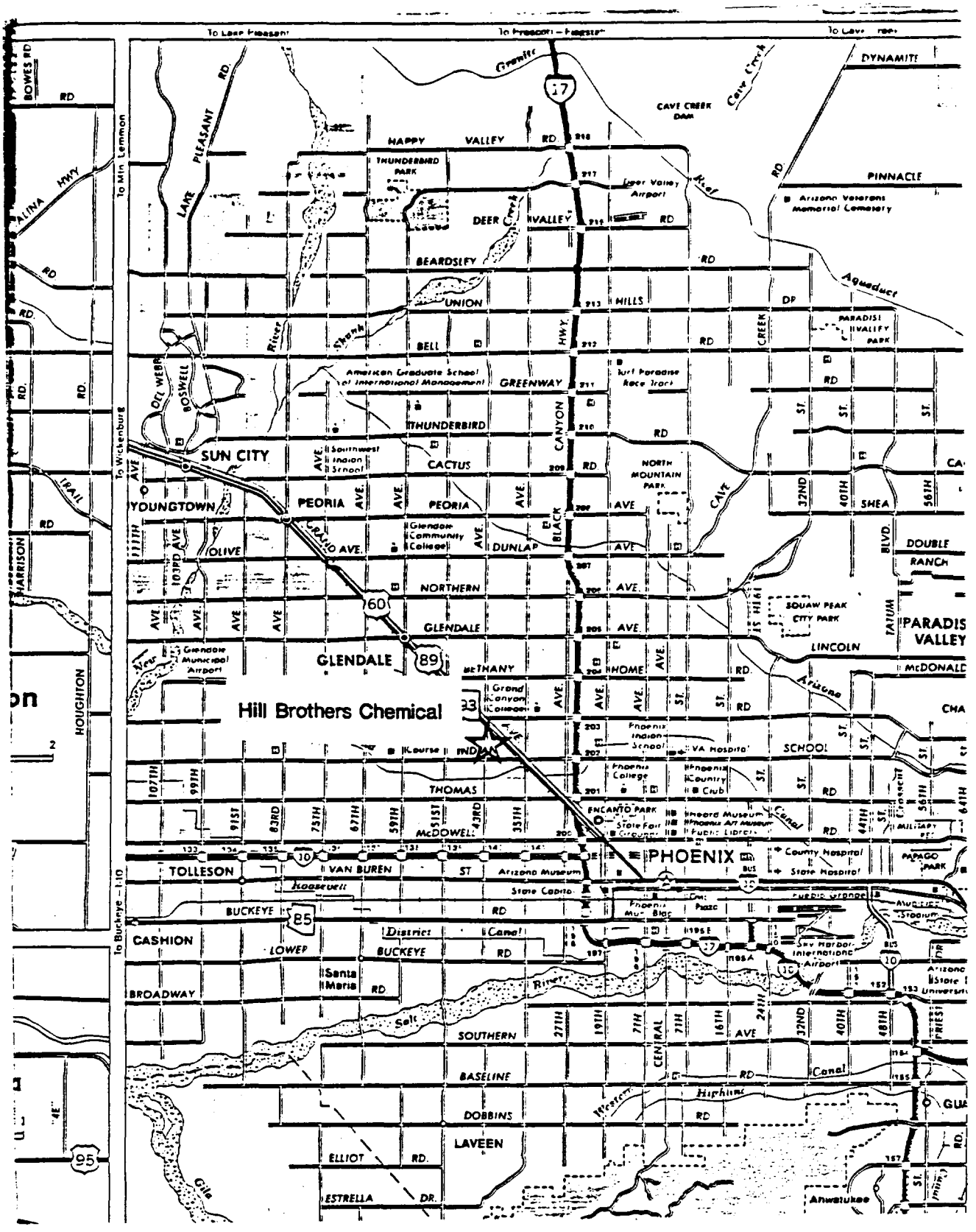


FIGURE 2

Site Map

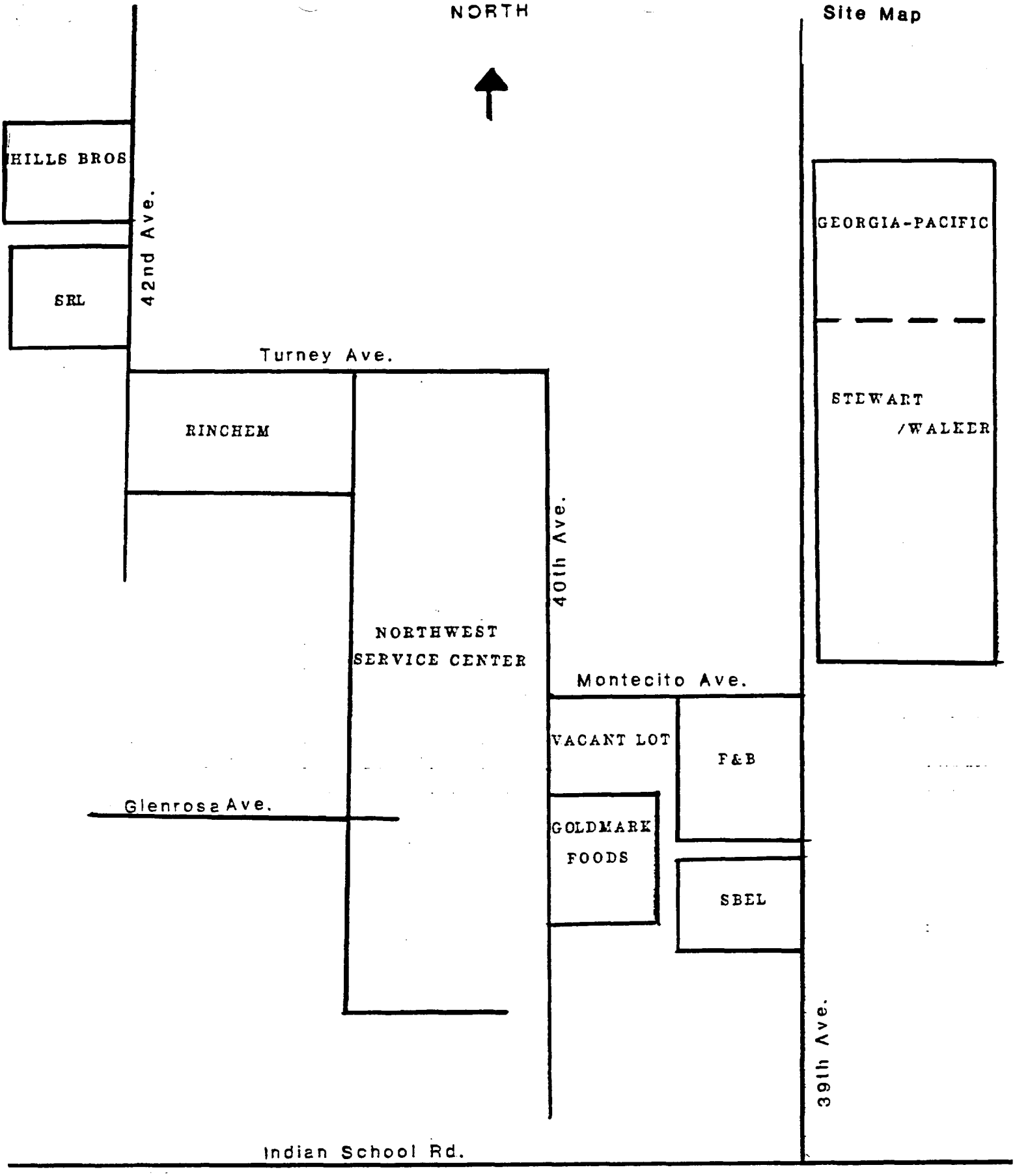
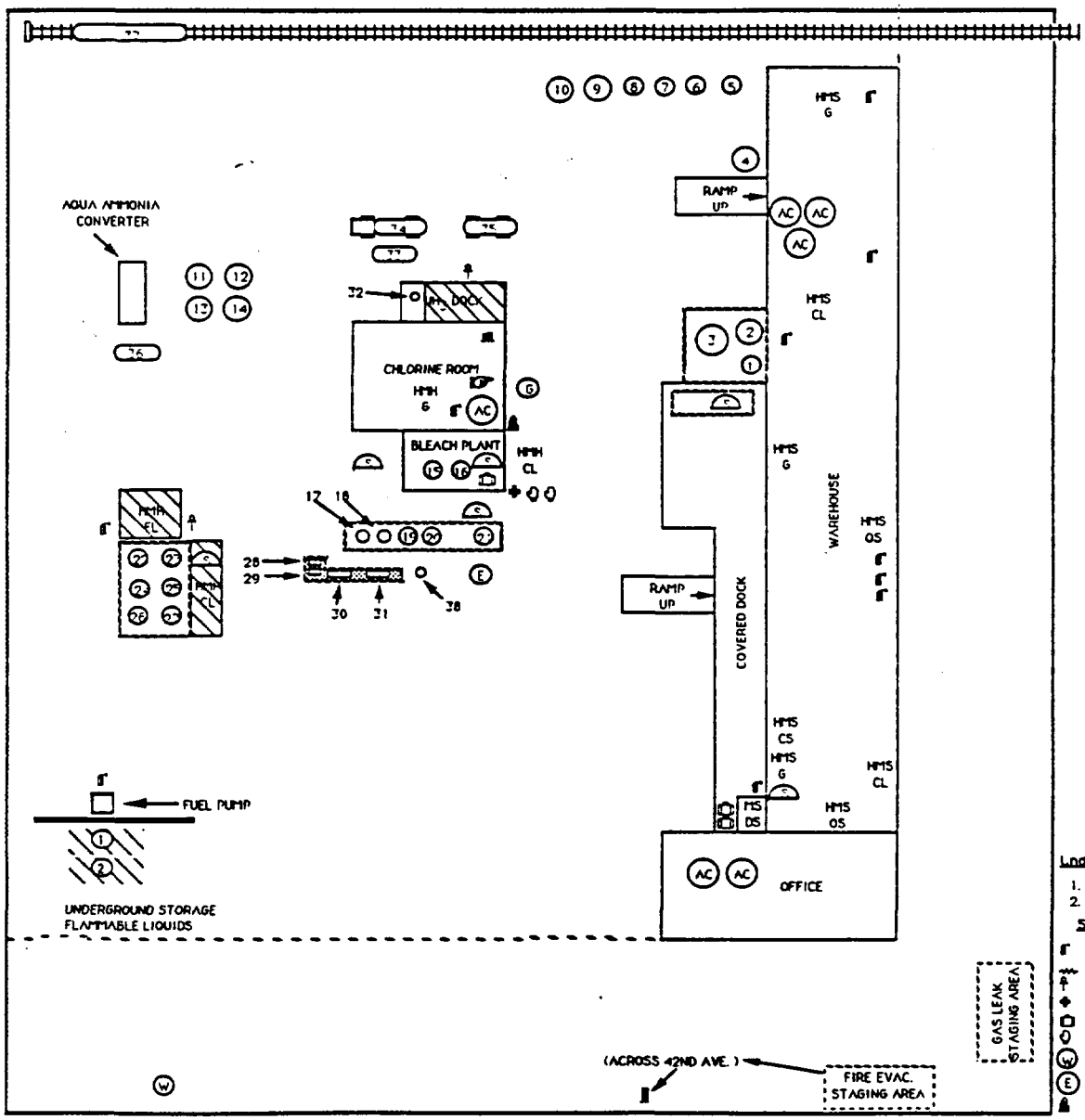


FIGURE 3.

Facility Map

ACEX TC TANKS

1. 50% SODIUM HYDROXIDE	5000 GAL	HMIS CL	20. 93% SULFURIC ACID	5000 GAL	HMIS CL
2. 10% SODIUM HYDOCHLORIDE	6000 GAL	HMIS CL	21. 40% SULFURIC ACID	9000 GAL	HMIS CL
3. 50% SODIUM HYDROXIDE	17000 GAL	HMIS CL	22. 1,1,1, TRICHLOROETHANE	3000 GAL	HMIS PL
4. 35% CALCIUM CHLORIDE	15000 GAL		23. 93% SULFURIC ACID	5000 GAL	HMIS CL
5. 35% CALCIUM CHLORIDE	5000 GAL		24. 1,1,1, TRICHLOROETHANE	3000 GAL	HMIS PL
6. 35% CALCIUM CHLORIDE	6000 GAL		25. 30% MURIATIC ACID	9000 GAL	HMIS CL
7. 38% CALCIUM CHLORIDE	5000 GAL		26. METHYLENE CHLORIDE	2000 GAL	PRESSURE TANK
8. 38% CALCIUM CHLORIDE	5000 GAL		27. NITRIC ACID 42 BE	4900 GAL	HMIS OCL
9. 38% CALCIUM CHLORIDE	10000 GAL		28. WASTE WATER TREATMENT	500 GAL	
10. 38% CALCIUM CHLORIDE	10000 GAL		29. WASTE WATER TREATMENT	500 GAL	
11. LIGNOSITE LIQUOR	10000 GAL		30. WASTE WATER TREATMENT	500 GAL	
12. HICO 610	6000 GAL		31. WASTE WATER TREATMENT	1000 GAL	
13. LIGNOSITE LIQUOR	10000 GAL		32. ANHYDROUS AMMONIA	1000 GAL	PRESSURE TANK HMIS G
14. HICO 630	10000 GAL		33. ANHYDROUS AMMONIA	10000 GAL	PRESSURE TANK HMIS G
15. 10% SODIUM HYPOCHLORITE	2500 GAL	HMIS CL	34. ANHYDROUS AMMONIA	5000 GAL	PRESSURE TANK TRANSPORT
16. 10% SODIUM HYPOCHLORITE	2500 GAL	HMIS CL	35. ANHYDROUS AMMONIA	5000 GAL	PRESSURE TANK TRANSPORT
17. 20% SODIUM HYDROXIDE	5000 GAL	HMIS CL	36. ANHYDROUS AMMONIA	1000 GAL	PRESSURE TANK HMIS G
18. 20% SODIUM HYDROXIDE	2000 GAL	HMIS CL	37. CHLORINE RAIL CAR	180000 LBS.	PRESSURE TANK HMIS PG
19. 50% SODIUM HYDROXIDE	6000 GAL	HMIS CL	38. 40% SULFURIC ACID	500 GAL	HMIS CL



Underground Tanks

1. 6,000 GAL. DIESEL
2. 6,000 GAL. DIESEL

Symbol legend:

- FIRE EXTINGUISHER
- FIRE HOSE
- SHOWER/EYEWASH
- FIRST AID
- SELF CONTAINED BREATHING
- ACID SUIT
- (W) WATER SHUTOFF
- (E) ELECTRICAL SHUTOFF
- A-KIT
- B-KIT
- FIRE HYDRANT
- REMOTE EMERGENCY SHUTOFF FOR CHLORINE RAILROAD CAR

SCALE IN FEET 20 40 60 80 100

HILL BROS. CHEMICAL CO.
4450 N. 42ND AVE.
PHOENIX, AZ. 85019
(602) 272-9363

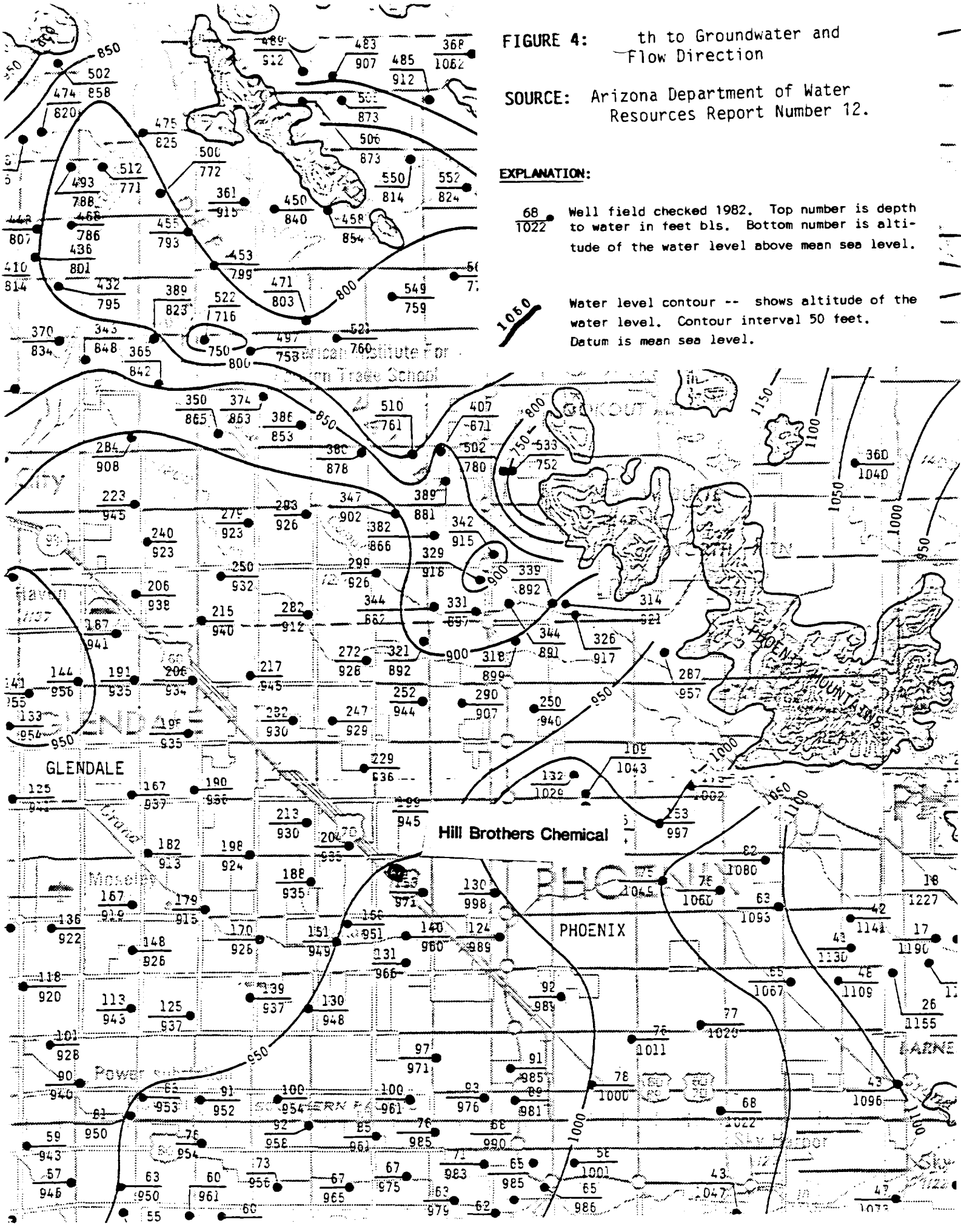


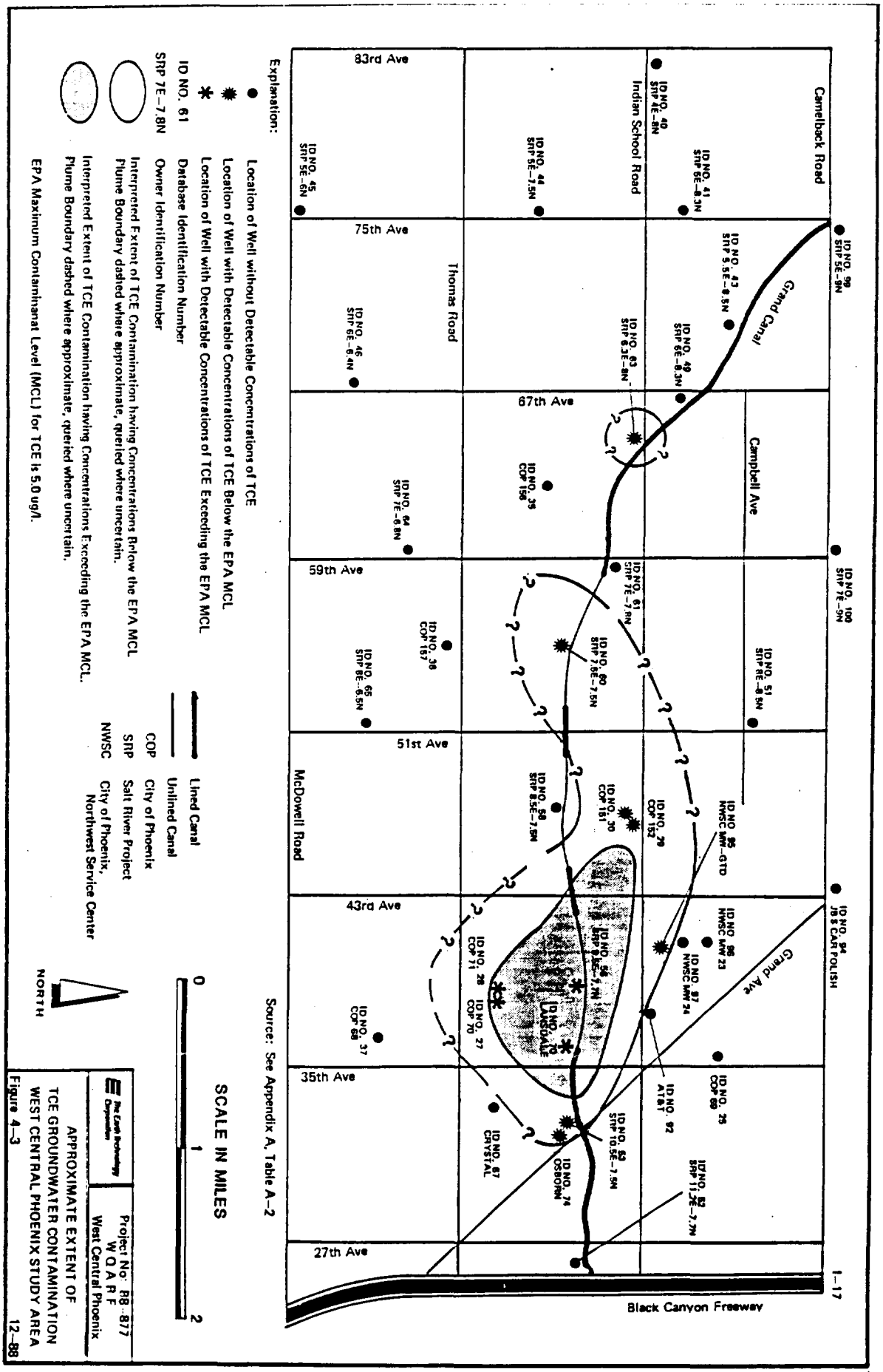
FIGURE 4: th to Groundwater and Flow Direction

SOURCE: Arizona Department of Water Resources Report Number 12.

EXPLANATION:

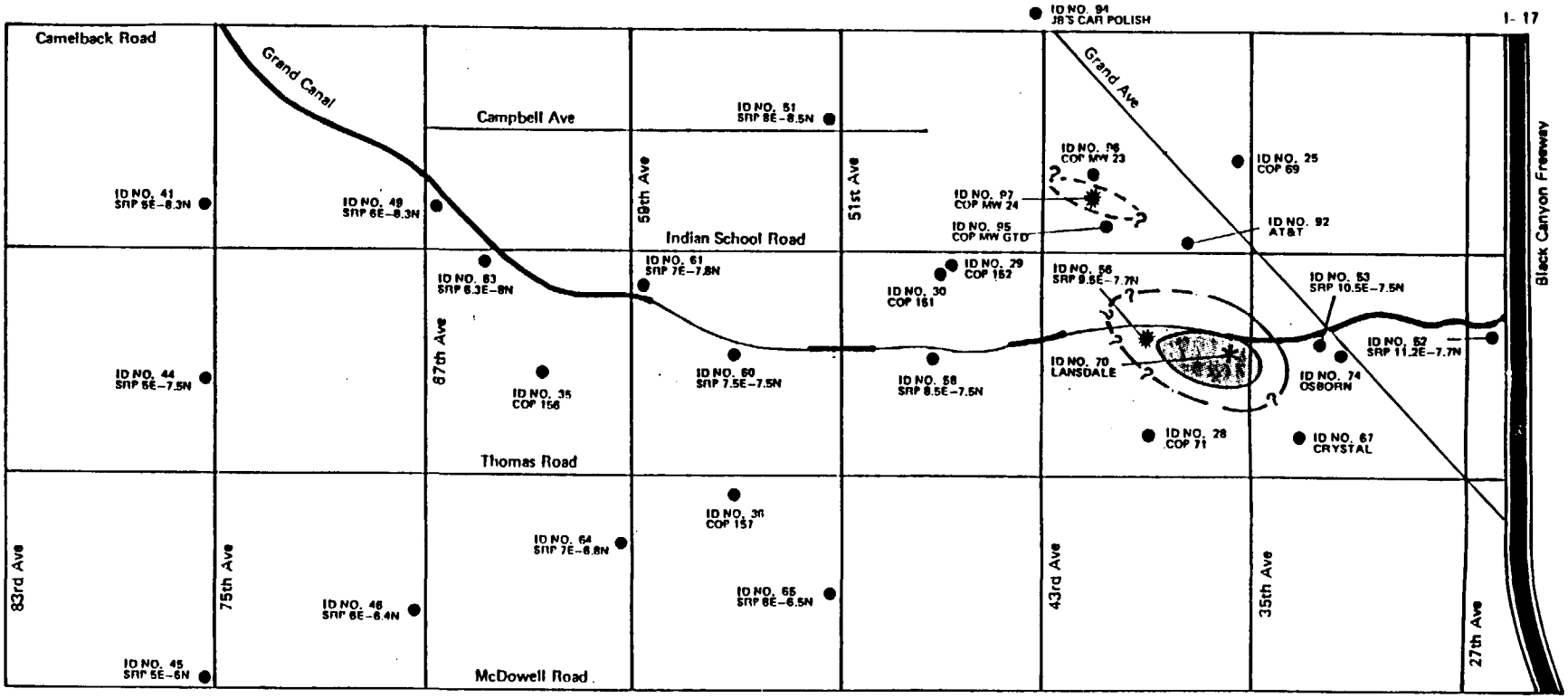
68 / 1022 — Well field checked 1982. Top number is depth to water in feet bls. Bottom number is altitude of the water level above mean sea level.

1050 — Water level contour -- shows altitude of the water level. Contour interval 50 feet. Datum is mean sea level.



DRAFT - SUBJECT TO REVIEW

FIGURE 5



Explanation:

- ● Location of Well without Detectable Concentrations of 1,1-DCE
- ✹ Location of Well with Detectable Concentrations of 1,1-DCE Below the Arizona Action Level and EPA MCL
- ✱ Location of Well with Detectable Concentrations of 1,1-DCE Exceeding the Arizona Action Level and EPA MCL
- ID NO. 61 Database Identification Number
- SRP 7E-7.8N Owner Identification Number
- Interpreted Extent of 1,1-DCE Contamination having Concentrations Below the Arizona Action Level and EPA MCL. Plume Boundary dashed where approximate, queried where uncertain.
- Interpreted Extent of 1,1-DCE Contamination having Concentrations Exceeding the Arizona Action Level and EPA MCL. Plume Boundary dashed where approximate, queried where uncertain.

Arizona Action Level and EPA Maximum Contaminant Level (MCL) for 1,1-DCE is 7.0 ug/l

- Lined Canal
- Unlined Canal
- COP City of Phoenix
- SRP Salt River Project
- NWSC City of Phoenix, Northwest Service Center

SCALE IN MILES
0 1 2

NORTH

Source: See Appendix A, Table A-2.

The Earth Technology Corporation

Project No: 88-877
WQARF
West Central Phoenix

APPROXIMATE EXTENT OF 1,1-DCE GROUNDWATER CONTAMINATION
WEST CENTRAL PHOENIX STUDY AREA
Figure 4-5 12-88

DRAFT - SUBJECT TO REVIEW

FIGURE 6

FIGURE 7 NWSC Wells

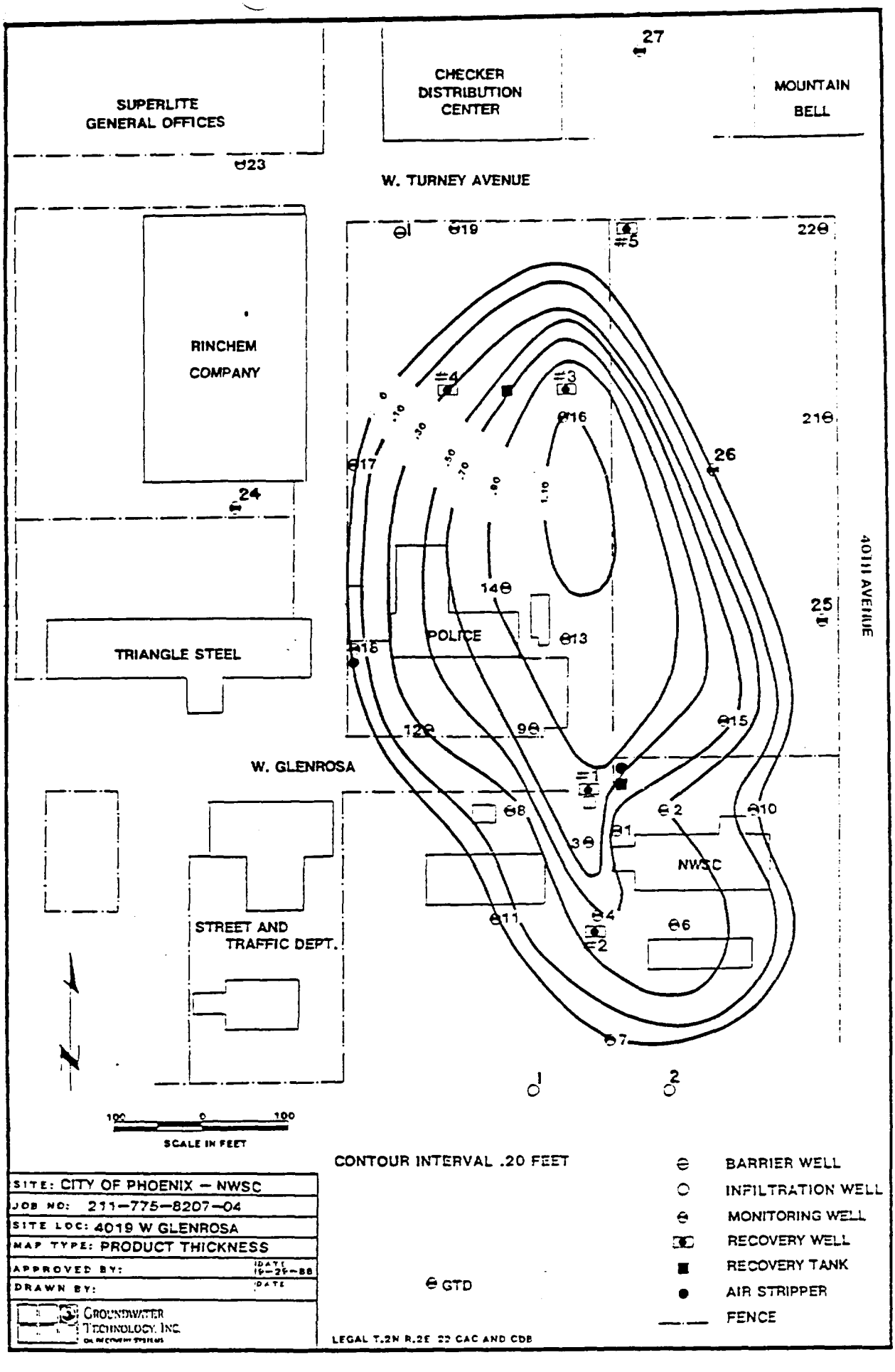
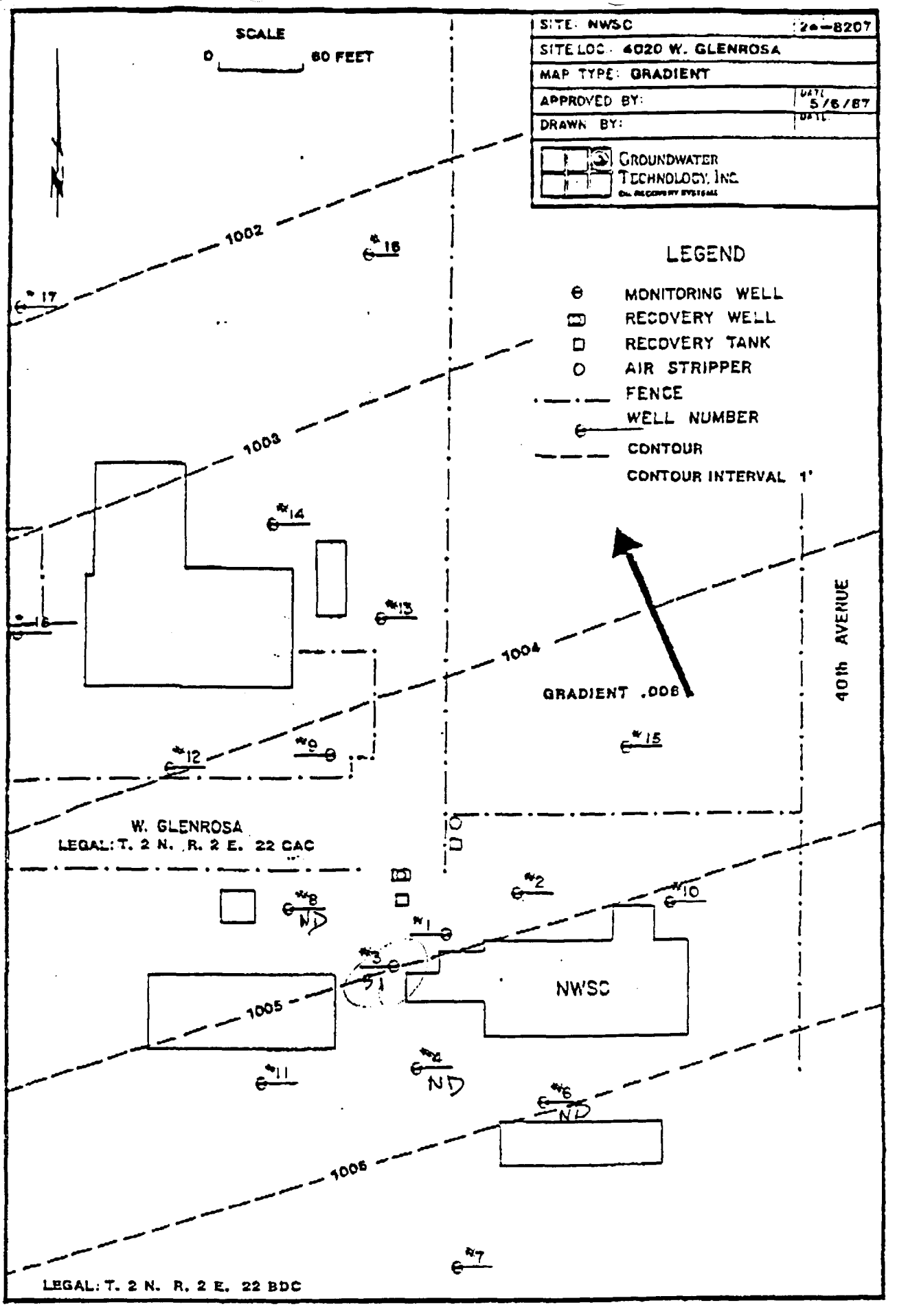


FIGURE 8 NWSC Gradient



Tables

TABLE 1.

LOCATION OF REGISTERED WELLS WITHIN A THREE MILE RADIUS OF HILL BROTHERS CHEMICAL CO.

Source: ADWR Data Base

WELL LOCATION	ADWR WELL REGISTRATION	USE	DATE DRILLED	DEPTH WELL	WATER LEVEL	DATE MEAS.
(A-01-02)01aab	55-617310	C	--	650		
(A-01-02)01bda	55-801094	I	1959	704		
(A-01-02)01cac	55-801093	I	1939	790		
(A-01-02)01cbb	55-629584	I	--	--		
(A-01-02)01dcc	55-520257	M	1988	110		
(A-01-02)01dcc	55-520258	M	1988	120		
(A-01-02)01dcc	55-520259	M	1988	120		
(A-01-02)01dda	55-507099	M	1984	200		
(A-01-02)02bcc	55-626533	P	--	--		
(A-01-02)02caa	55-522458	C	1989	260		
(A-01-02)02cad	55-086545	C	1980	150		
(A-01-02)03abb	55-602408	H	1912	--		
(A-01-02)03abd	55-522457	H	--	--		
(A-01-02)03dad	55-522457	C	1989	260		
(A-01-02)04baa	55-641463	I	--	--		
(A-01-02)09aaa	55-520623	M	--	--		
(A-01-02)09aaa	55-520624	M	--	--		
(A-01-02)09aaa	55-520625	M	--	--		
(A-01-02)09aaa	55-520626	M	1988	119		
(A-01-02)09aaa	55-607201	I	1957	500		
(A-01-02)10	55-803793	H	1973	123		
(A-01-02)10aba	55-607200	I	1943	454		
(A-02-02)08aa	55-800888	N	1950	400		
(A-02-02)09add2	55-608375	I	1963	1002	225.5	1984
(A-02-02)09bad	55-604116	P	1958	1955	200	1981
(A-02-02)10da	55-639878	--	--	--		
(A-02-02)11bbb	55-518129	M	1987	55	dry	
(A-02-02)13dcc	55-617702	U	1924	202		
(A-02-02)14cbc2	55-608376	I	1948	702	163.7	1988
(A-02-02)14dbb	55-626559	P	1954	602	157.7	1987
(A-02-02)15dca	55-626554	P	1959	1200	174.4	1987
(A-02-02)16bbc	55-604776	U	1952	650	75.3	1986
(A-02-02)16dbb	55-634575	H	1949	--		
(A-02-02)16dda	55-086999	H	1981	510		
(A-02-02)16ddd	55-604114	P	1950	1300		
(A-02-02)17acb	55-608383	I	1962	1570	75.3	1986
(A-02-02)17ada	55-608382	I	1929	454	75.3	1986
(A-02-02)18ddd	55-607674	I	1929	390	168.9	1988
(A-02-02)19bba	55-522463	N	1989	260		
(A-02-02)20add	55-608372	I	1949	700	235.6	1986
(A-02-02)22add	55-634633	H	1979	500		
(A-02-02)22cab	55-523286	M	1989	140		
(A-02-02)22cac	55-521983	M	1988	135		
(A-02-02)22cac	55-522164	M	1988	155		
(A-02-02)22cac	55-522165	M	1988	155		
(A-02-02)22cac	55-522163	M	1988	160		

P = public supply, H = domestic, I = irrigation

M = monitoring, T = test, -- = unknown

C = cathodic, N = non use, U = unused

TABLE 1.

LOCATION OF REGISTERED WELLS WITHIN A THREE MILE RADIUS OF HILL BROTHERS CHEMICAL CO.

Source: ADWR Data Base

WELL LOCATION	ADWR WELL REGISTRATION	USE	DATE DRILLED	DEPTH WELL	WATER LEVEL	DATE MEAS.
(A-02-02)22cac	55-518077	M	1988	150		
(A-02-02)22cac	55-515979	M	1988	130		
(A-02-02)22cac	55-520313	M	1988	140		
(A-02-02)22cac	55-518071	M	1987	150		
(A-02-02)22cac	55-518070	M	1987	150		
(A-02-02)22cac	55-515553	M	1986	145		
(A-02-02)22cac	55-516109	M	1986	147		
(A-02-02)22cac	55-516110	M	1986	155		
(A-02-02)22cac	55-516111	M	1986	155		
(A-02-02)22cac	55-515554	M	1986	145		
(A-02-02)22cac	55-515555	M	1986	145		
(A-02-02)22cac	55-515556	M	1986	145		
(A-02-02)22cac	55-515557	M	1987	150		
(A-02-02)22cac	55-515558	M	1987	140		
(A-02-02)22cac	55-514743	M	1986	135		
(A-02-02)22cac	55-514746	M	1986	135		
(A-02-02)22cac	55-514747	M	1986	135		
(A-02-02)22cad	55-521984	M	1988	135		
(A-02-02)22cba	55-518072	M	1987	150		
(A-02-02)22cdb	55-514564	T	1986	130		
(A-02-02)22cdb	55-514744	M	1986	135		
(A-02-02)22cdb	55-514905	M	1986	142		
(A-02-02)22cdb	55-514745	M	1986	135		
(A-02-02)22cdb	55-514565	T	1986	130		
(A-02-02)22cdb	55-514559	T	1986	130		
(A-02-02)22cdb	55-514561	T	1987	130		
(A-02-02)22cdb	55-514562	T	1986	130		
(A-02-02)22cdb	55-514563	T	1986	130		
(A-02-02)22cdb	55-514429	M	1988	125		
(A-02-02)22cdb	55-514566	T	1986	130		
(A-02-02)22daa	55-626551	P	1954	405		
(A-02-02)22dcd	55-520570	M	1988	130		
(A-02-02)24aaa	55-607691	U	1919	470	72.5	1984
(A-02-02)24cbb	55-626555	U	1952	400		
(A-02-02)24dbb	55-522462	N	1989	260		
(A-02-02)25bbb	55-522840	M	1988	95		
(A-02-02)25bbb	55-522841	M	1988	500	150.8	1986
(A-02-02)25bca	55-617850	I	1950	500	150.8	1986
(A-02-02)25ccb	55-522459	N	1989	260		
(A-02-02)26bdc	55-608377	I	1949	698	129	1981
(A-02-02)26bdd	55-618512	P	1949	--	195.8	1986
(A-02-02)26cdb	55-800680	P	1974	950		
(A-02-02)27abc	55-522461	N	1989	260		
(A-02-02)27acb	55-608381	I	1948	700	140.4	1982
(A-02-02)27adc	55-603866	P	1949	--	129	1981
(A-02-02)27dcb1	55-626552	P	1974	--	130.7	1982

P = public supply, H = domestic, I = irrigation

M = monitoring, T = test, -- = unknown

C = cathodic, N = non use, U = unused

TABLE 1.

LOCATION OF REGISTERED WELLS WITHIN A THREE MILE RADIUS OF HILL BROTHERS CHEMICAL CO.

Source: ADWR Data Base

WELL LOCATION	ADWR WELL REGISTRATION	USE	DATE DRILLED	DEPTH WELL	WATER LEVEL	DATE MEAS.
(A-02-02)27dcb2	55-626553	P	1974	--	130.7	1982
(A-02-02)28abb1	55-626575	P	--	650	119.3	1984
(A-02-02)28abb2	55-626576	P	--	--	159.7	1982
(A-02-02)28bdd2	55-608374	I	1948	700	151	1982
(A-02-02)29acc	55-607675	I	1949	700	183.4	1986
(A-02-02)29bcb	55-608387	I	1949	700	170.1	1982
(A-02-02)29ddd	55-519666	M	1987	50		
(A-02-02)29ddd	55-519667	M	1987	50		
(A-02-02)30baa	55-626577	P	1958	710		
(A-02-02)30baa	55-626578	P	1958	545		
(A-02-02)30bab	55-626587	I	1946	1100	150.2	1986
(A-02-02)30dbb	55-626579	P	1948	504	151	1982
(A-02-02)31ada	55-607727	I	--	550	153.8	1986
(A-02-02)32abb	55-626580	P	1946	696	153.8	1986
(A-02-02)32daa	55-607736	I	1948	616	130.3	1982
(A-02-02)34	55-628053	H	--	175		
(A-02-02)34adc	55-626550	P	1946	434	113	1982
(A-02-02)35	55-522460	N	1989	260		
(A-02-02)35bcb	55-521049	M	1988	130		
(A-02-02)35bcb	55-521051	M	1988	130		
(A-02-02)35bcb	55-521878	M	1988	125		
(A-02-02)35bcb	55-522188	M	1988	130		
(A-02-02)35bcb	55-522189	M	1988	130		
(A-02-02)35bcb	55-520571	M	1988	80		
(A-02-02)35bcb	55-520572	M	1988	80		
(A-02-02)35bcb	55-520573	M	1988	130		
(A-02-02)35bcb	55-520574	M	1988	80		
(A-02-02)35cdd	55-626561	P	--	381		
(A-02-02)36cba	55-603550	N	1966	780		
(A-02-02)36dac	55-086544	P	1980	150		
(A-02-02)36dbd	55-522805	M	1988	110		
(A-02-02)36dcd1	55-617311	U	--	--		
(A-02-02)36dcd2	55-617312	N	1961	655		
(A-02-02)36dcc	55-520310	M	1988	110		
(A-02-03)18ccc	55-520865	M	1988	40		
(A-02-03)19bcd	55-626565	P	--	650	130.0	1987
(A-02-03)19dbb	55-617697	U	1924	204		
(A-02-03)19dca	55-639654	H	--	--		
(A-02-03)30abd	55-086539	P	1980	150		
(A-02-03)31bcd	55-626536	I	--	--		

P = public supply, H = domestic, I = irrigation

M = momitoring, T = test, -- = unknown

C = cathodic, N = non use, U = unused

TABLE 2.

HAZARDOUS MATERIALS INVENTORY STATEMENT
DATE: 14 SEPTEMBER 1988 UPDATE: 9 NOVEMBER 1988
BUSINESS NAME: HILL BROTHERS CHEMICAL
BUSINESS ADDRESS: 4450 N. 42ND AVE. PHOENIX, AZ. 85019
SUBMITTED BY: EVERETT McLEAN, COMPLIANCE & SAFETY COORDINATOR
BUSINESS PHONE: (602) 272-9363

UN/NA NUMBER	DOT CLASS	CHEMICAL ABSTRACT NUMBER	CHEMICAL NAME COMPONENTS, CONCENTRATIONS	COMMON OR TRADE	MAX QTY ON HAND	MIN QTY ON HAND	UNIT MEAS	MAP LOC
UN 2789	CORR	00064197	ACETIC ACID		950	475	LBS	
UN 1463	OXY	01333820	CHROMIC ACID		5,400	500	LBS	
UN 1170	FL	00064175	DENATURED ALCOHOL	ETHYL ALCOHOL	700	165	GAL	
UN 1773	N/A	07705080	FERRIC CHLORIDE		880	55	GAL	
UN 1230	FL	00067561	METHANOL	METHYL ALCOHOL	2,000	200	GAL	
UN 1193	FL	00078933	METHYL ETHYL KETONE	MEK	700	165	GAL	
UN 1789	CORR	07647010	**HYDROCHLORIC ACID**	MURIATIC ACID	10,000	4,000	GAL	
UN 1090	FL	00067630	ACETONE		600	100	GAL	

Bold Type indicates an Extremely Hazardous Chemical

UN/NA NUMBER	DOT CLASS	CHEMICAL ABSTRACT NUMBER	CHEMICAL NAME COMPONENTS, CONCENTRATIONS	COMMON OR TRADE	MAX QTY ON HAND	MIN QTY ON HAND	UNIT MEAS	MAP LOC
UN 1005	NFG	07664417	**ANHYDROUS AMMONIA**		90,000	30,000	LBS	
UN 2672	CORR	01336216	**AMMONIUM HYDROXIDE**	**AQUA AMMONIA**	3,000	750	GAL	
N/A	N/A	N/A	BRIGHT DIP		100	0	GAL	
UN 1748	OXY	07778543	CALCIUM HYPOCHLORITE	PITTCHLOR	30,000	4,000	LBS	
UN 1824	CORR	01310732	SODIUM HYDROXIDE	CAUSTIC SODA FLAKE	60,000	12,000	LBS	
UN 1824	CORR	01310732	SODIUM HYDROXIDE	**CAUSTIC SODA LIQUID**	30,000	7,000	GAL	
UN 1017	NFG	07782505	**CHLORINE GAS**		500,000	160,000	LBS	
UN 1791	CORR	0781529	SODIUM HYPOCHLORITE		8,000	1,000	GAL	
UN 1789	CORR	07647010	H.B. CONCRETE REMOVER	MURATIC ACID	150	0	GAL	
UN 1773	N/A	07705080	FERRIC CHLORIDE		880	55	GAL	

UN/NA NUMBER	DOT CLASS	CHEMICAL ABSTRACT NUMBER	CHEMICAL NAME COMPONENTS, CONCENTRATIONS	COMMON OR TRADE	MAX QTY ON HAND	MIN QTY ON HAND	UNIT MEAS	MAP LOC
UN 1219	FL	00067630	ISOPROPYL ALCOHOL		800	165	GAL	
UN 1789	CORR	007647010	HI SOL	MURATIC ACID	1,375	0	GAL	
UN 1789	CORR	07647010	**HYDROCHLORIC ACID**	REAGENT MURATIC ACID	36	0	LBS	
UN 1593	N/A	00075092	METHYLENE CHLORIDE	DICHLOR-METHANE	2,000	400	GAL	
N/A	N/A	N/A	NEUTRAL CHROMATE	H.B. #222	55	0	GAL	
UN 2031	OXY	07697372	**NITRIC ACID**		4,500	1,000	GAL	
N/A	N/A	00144627	OXALIC ACID		2,200	330	LBS	
UN 1897	N/A	00127184	PERCHLORO-ETHYLENE	TETRACHLO-ROETHYLENE	200	55	GAL	
UN 1805	CORR	07664382	PHOSPHORIC ACID	75%	1,400	250	GAL	
UN 1805	CORR	07664382	PHOSPHORIC ACID	85%	600	150	GAL	

UN/NA NUMBER	DOT CLASS	CHEMICAL ABSTRACT NUMBER	CHEMICAL NAME COMPONENTS, CONCENTRATIONS	COMMON OR TRADE	MAX QTY ON HAND	MIN QTY ON HAND	UNIT MEAS	MAP LOC
UN 1840	CORR	01310732	POTASSIUM HYDROXIDE	CAUSTIC POTASH	10,000	1,200	LBS	
UN 1490	OXY	07722647	POTASSIUM PERMANGANATE		6,000	1,000	LBS	
UN 1789	CORR	07647010	#241 SCALE SOLVENT	INHIBITED MURIATIC ACID	300	60	GAL	
UN 1079	NFG	07446095	SULFUR DIOXIDE GAS		8,000	4,000	LBS	
UN 1830	CORR	07664939	**SULFURIC ACID 93-95%**		10,000	4,000	GAL	
UN 1830	CORR	07664939	**SULFURIC ACID 40%**		10,000	2,000	GAL	
UN 1830	CORR	07664939	**SUFURIC ACID**	REAGENT	700	100	GAL	
UN 1294	FL	00108863	TOLUENE		500	150	GAL	
UN 2831	N/A	00071556	1,1,1, TRICHLORO-ETHANE		6,000	1,000	GAL	
UN 1307	FL	01330207	XYLENE		500	150	GAL	
N/A	N/A	N/A	CLASSIC COATING LACQUER		300	40	GAL	

UN/NA NUMBER	DOT CLASS	CHEMICAL ABSTRACT NUMBER	CHEMICAL NAME COMPONENTS, CONCENTRATIONS	COMMON OR TRADE	MAX QTY ON HAND	MIN QTY ON HAND	UNIT MEAS	MAP LOC
N/A	N/A	N/A	HICO WATER REPELLENT		300	15	GAL	
N/A	FL	N/A	PAINT/DESERT BRAND THINNER	SEALER SOLVENT	50	10	GAL	

SECTION III

APPENDICES

APPENDIX A

CONTACT MEMORANDA

PA/SI CONTACT LOG

Facility Name: Hill Bros. Chemical Company
Facility ID #: AZD008397242

NAME	AFFILIATION	PHONE #	DATE	INFORMATION
Drive-by	--------	------	03/20/89	Site map and access data
Barbara Herron	ADEQ-UST	(602) 257-2203	03/23/89	Search UST Files - NO DATA
Coles City Dir.	--------	------	03/24/89	Site History
Larry Crisafilli	Maricopa County	(602)258-6381	03/24/89	Data Re: Air Permit A8601089

CONTACT REPORT

CONTACT BY J. Heywood DATE 3/20/89 TIME _____

DISTRIBUTE TO H.11 Bros Chemical PA File

AZD008397242 State ID # - 329

BETWEEN Drive-by TELEPHONE (___) _____

OF _____

AND _____ EHS

REGARDING H.11 Bros Chemical

DISCUSSION Drive by and walk around H.11 Bros. Facility.
Located at 4450 N. 42nd Ave

1- Bordered on north by Hogon Manuf. - out of operation
(appears was a large Facility

2- Bordered on East by 42nd Ave

3- Bordered on South by SRL Co. (Frozen food transport)

4- Bordered on west by R.R. tracks.

5- Site is fenced, access is restricted to office and
parking

6- COP. NW SC is approx 0.25 mile south east of
H.11 Bros.

7- Site and Facility map drawn

8- No photos taken.

ACTION ITEMS _____

VI:CRPT

CONTACT REPORT

CONTACT BY J. Heywood DATE 3/24/89 TIME 2^00 pm

DISTRIBUTE TO H.II Bros. Chemical PA file

AZD008397242 State ID # 329

BETWEEN Larry CRisafulli TELEPHONE (602) 258-6381

OF Maricopa County Air Quality

AND J. Heywood EHS

REGARDING H.II Bros Air Permit # A8601089

DISCUSSION This facility is inspected on an annual basis. The last inspection was 12/21/88. H.II Bros has installed pollution control devices on site, they include hooded vent from liquid chlorine, H_2SO_4, Muriatic acid, anhydrous ammonia, to a water scrubber.

H.II Bros has 2 above ground bulk storage tanks for 1,1,1-TCA equipped with control values and pressure Release values.

H.II Bros has a permit for a paint booth.

The File indicates no record of any incidents, violations or complaints re: H.II Bros.

ACTION ITEMS

VI:CRPT

CONTACT REPORT

CONTACT BY J. Heywood DATE 3/24/89 TIME 1130

DISTRIBUTE TO Georgia-Pacific PA File

AZD 080664001

4239 & 4245 N. 39th Ave

BETWEEN Coles City of Phoenix Directory TELEPHONE (___) ___

OF Phoenix Public Library - Main Branch

AND Reference Section EHS

REGARDING Georgia-Pacific - Stewart/Walker - Land use history

DISCUSSION Checked dates 1966 through 1988

1966 - Not Listed

1967 - 1968 - not listed

1969 - Plastic Containera Corp. Bottle Manufacturing

1970 - 1976 - Plastic Container Corp.

1977 - 1987 Georgia-Pacific

1987 - 1988 Georgia-Pacific + Stewart/Walker.

ACTION ITEMS

VI:CRPT